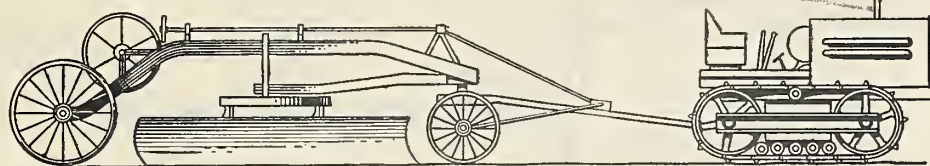


Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

1.9
F76ch

CONSTRUCTION



HINTS

UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE
WASHINGTON, D. C.

Vol. 4

September 24, 1938.

No. 18

GUARD FOR TOOL GRINDER

Construction Hints of June 25, 1938 included a plan for a hood to be used on tool grinders.

Additional information has revealed that it is necessary to provide these hoods with an adjustable tongue to provide proper coverage of the face of the stone as it wears down.

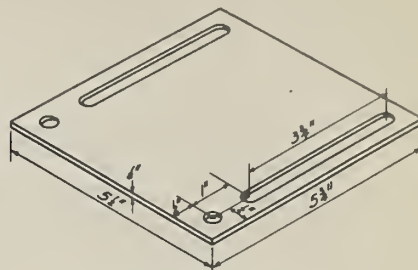
The accompanying print, shown on page 2, includes this additional safety feature and you are requested to provide all hoods already in use and any made up in the future with this adjustable plate.

This is an addition to the original plan and in no way changes the design of the original hood.

This correction is made at the suggestion of Region 8.

If you are in a hurry; start sooner.

(over)



5 1/2"

3"

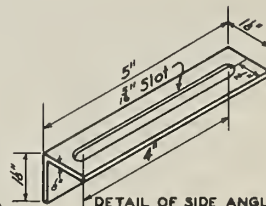
PLAN
(ADJUSTABLE
PLATE NOT SHOWN)

3 1/2"

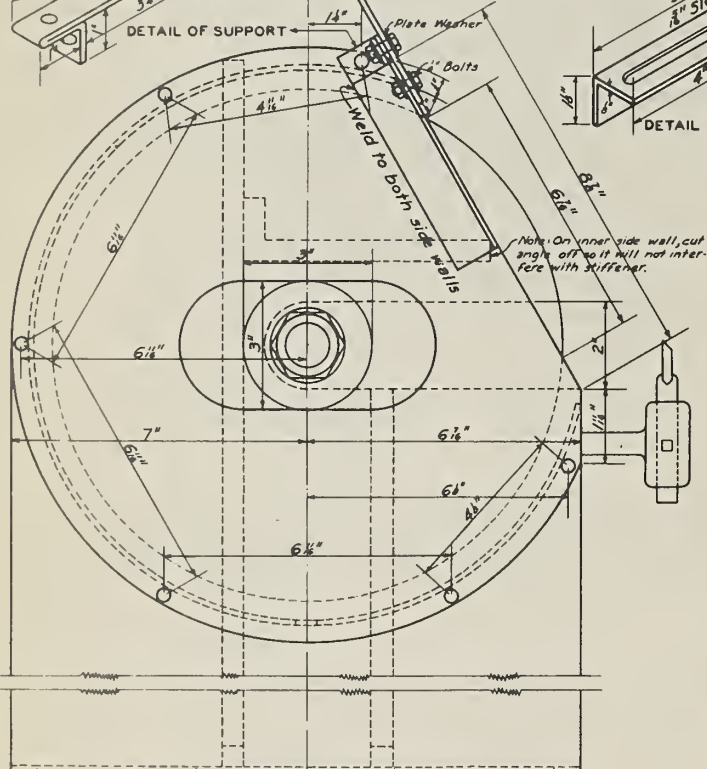
1 1/4"

DETAIL OF SUPPORT

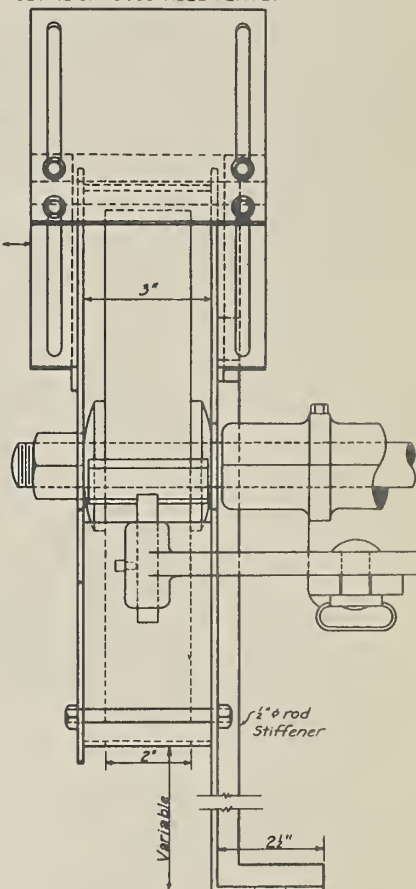
Plate



DETAIL OF SIDE ANGLE



SIDE ELEVATION



END ELEVATION

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
REGION 8 R. E. PIDGEON REGIONAL ENGR.

GUARD
FOR
TOOL GRINDER

DESIGNED HWA DRAWN GG TRACED GG
SCALE 1"=10' IN CHECKED HWA
APPROVED W. B. [Signature] DATE 4/24/07

SHEET 1 OF 1

DRAWING M-240

BUILDING UP CRUSHER DIES

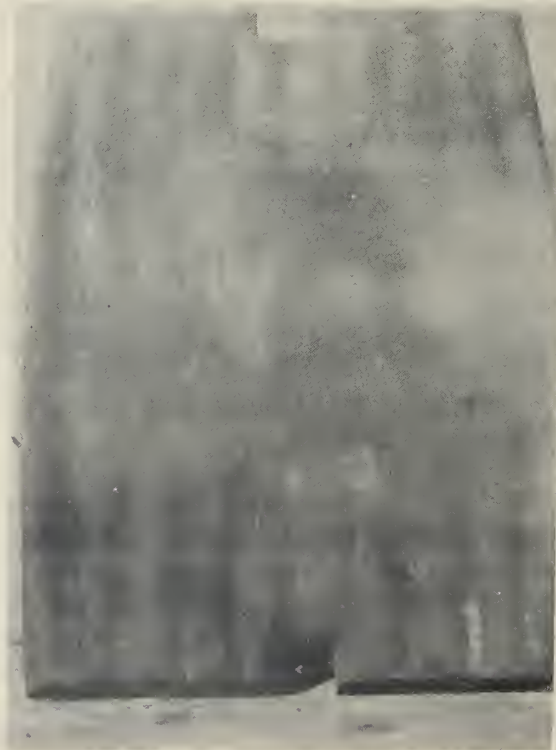
It has been definitely proven that worn crusher dies can be successfully built up at a substantial saving over wearing them out and replacing them with new ones. This has been done for some time by some of the Forests with varying degrees of success. The latest, and apparently most successful, method was developed by George Morgan, Welder, of the Pisgah Central Repair Shop, and has been successfully used by the Cherokee.

The greatest problem in building up crusher dies has been that of controlling warpage. At first every effort was made to prevent warpage, but invariably some warpage would occur, and usually to the extent that the die would be unfit for further use. (It is necessary, of course, that the die seat properly on the jaw, otherwise serious damage to the crusher may result.) Therefore, warpage must be controlled instead of prevented. To do this the die is first purposely warped in the opposite direction, to the extent that when the building up process is finished the die has come back to its proper position.

The extent to which the die must be purposely warped depends on its type, size and thickness, and the amount of heat applied in the building up process, therefore this must be determined largely through experience. Usually for the type shown in the attached photographs, which is a 10x30 Champion, from 1/2" to 3/4" warpage is sufficient.

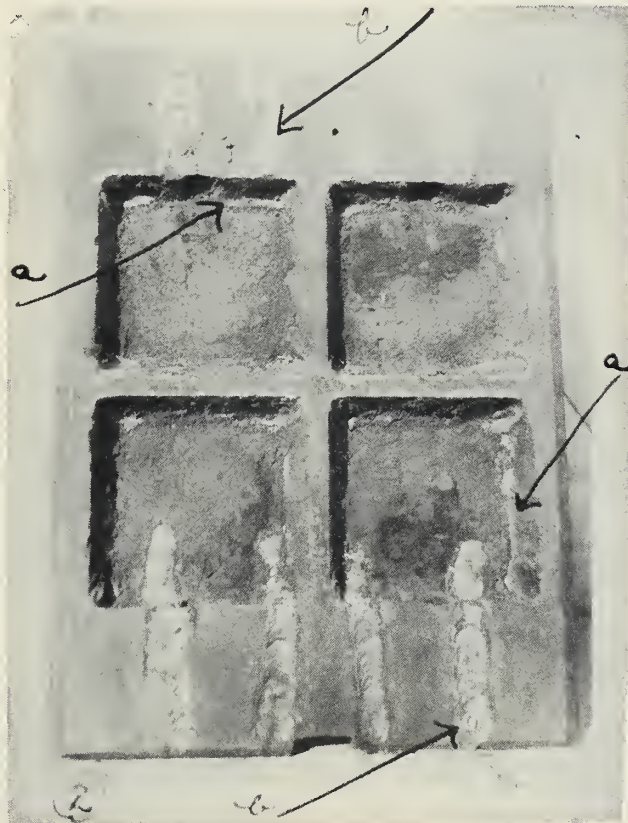
Following is the method used by Mr. Morgan, illustrated by photographs.

Photograph #1 shows a die as it was removed from the crusher and is in about the proper condition to be economically reconditioned.



Step 1.

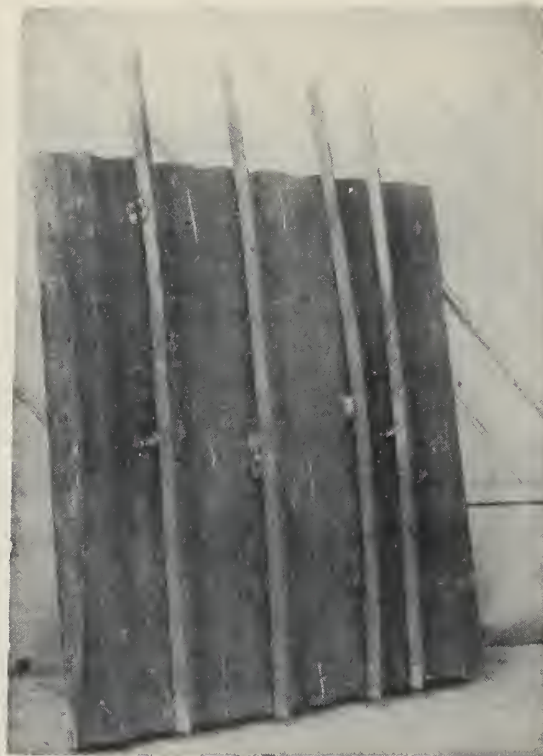
Photograph #2 shows the process of pre-warping.



This is accomplished by applying a heavy weld around the recesses marked "a" and by cutting out grooves with a cutting torch and filling in with electrodes (see arrow "b") being careful that no head or ridge is left higher than the remainder of the die seat. Use fairly high amperage in this operation, as the object is to cause warpage.

Step 2.

Photograph #3 shows the application of AMSCO Applicator bar and the method of applying.



This bar is manufactured by American Manganese Steel Company, and can be had in either square or round form and in any desired size. The correct size for this purpose is from $3/8"$ to $3/4"$. If a high, sharp corrugation is desired use a square bar set on the corner, and if a round corrugation is desired use a round rod.

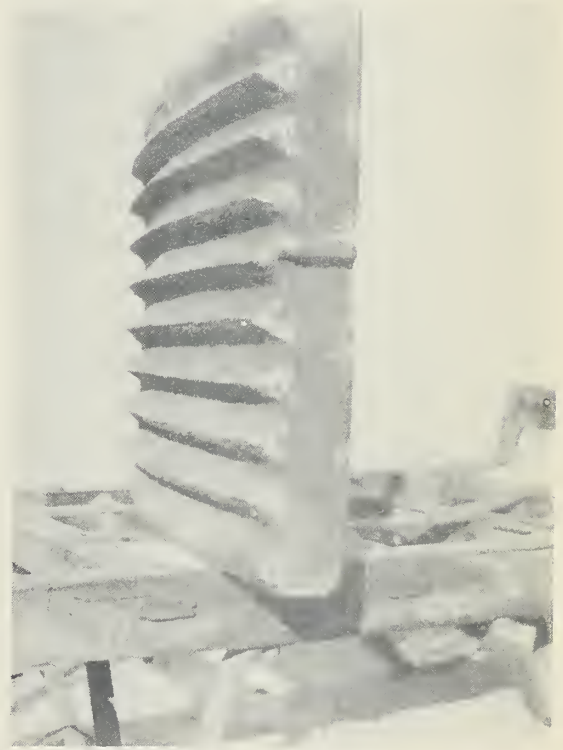
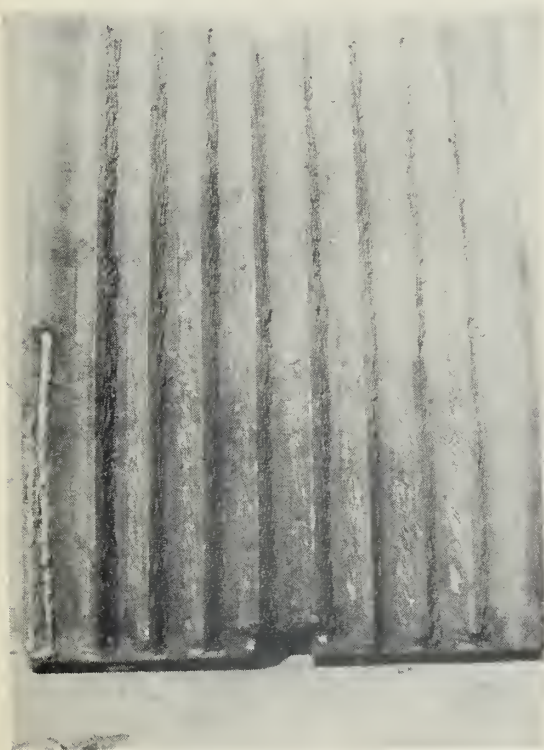
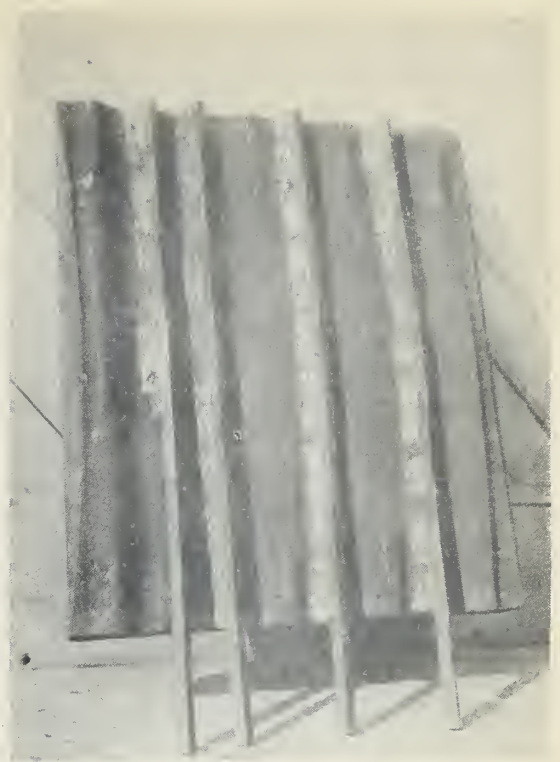
Note that the bars are first placed on every other corrugation. This is to avoid concentrating heat as much as possible. Also note that the bar is first curved to fit the die and then "tacked" at each end and in the middle. This is to prevent it from moving because of expansion when heat is applied.

Step 3.

Photograph #4.

Now the "V" is filled in, using a good nickle manganese electrode or similar material. The welds should be made in short runs, alternating from one bar to another, and from one end to the other, to avoid concentrating too much heat at one point. It may be necessary to suspend welding altogether at intervals, to allow the die to cool.

The remaining corrugations are built up in the same manner, until the job is finished, as illustrated in photographs #5 and #6.



This particular die, as can be seen, is worn fairly uniformly over its entire surface. However, in some types of crushers and in crushing some types of stone, the wear is concentrated at a point 6" or 8" up from the lower end.

When this condition exists, short pieces of different size rods or bars may be used. For instance, where the greatest wear occurs use a 5/8" section with a 1/2" section at each end of the 5/8", and finally a 3/8" if necessary. A slight offset at the joint is not objectionable but can be reduced by forging the ends of the larger rod slightly.

If desired, hard surface material may be applied to the top of the corrugations. Studite and Stelite are satisfactory hard surfacing material.

If not allowed to wear excessively, crusher dies may be built up in the above manner repeatedly. The cost to the Pisgah, according to their statement, is from \$18 to \$25 each for labor and materials to treat a 10x30 Champion die.